SECTION 1

Introduction and Safety

INTRODUCTION AND SAFETY

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1A .1 INTRODUCTION

The purpose of this manual is to assist Dealers and Distributors in the efficient repair and maintenance of MF2605/2615 farm tractors. Carrying out the procedures as detailed, together with the use of special tools where appropriate, will enable the operations to be completed within the time stated in the Repair Time Schedule.

To assist with locating information, each section of the manual is preceded by a contents page listing the operations. Each instruction within an operation has a sequence number, and to complete the operation in the minimum time it is essential that these instructions are performed in numerical sequence commencing at 1, unless otherwise stated.

When applicable, these sequence numbers identify the components in the appropriate illustration. When an operation requires the use of a special tool, the tool number is quoted under the operation heading and is repeated in, or following, the instruction involving its use.

Indexing

For convenience, the manual is divided into sections and parts, each page bearing a section and part number. The sections are subdivided into numbered operations

Definition of Terms

The operation description generally used throughout the schedules may be defined as follows :

Removed and Refitment

Remove and refit an original part or assembly, or a new part or assembly which does not involve additional operations or time

Install

Install a part or component not previously fitted e.g. accessories.

Overhaul

Remove a part or assembly, dismantle, inspect and recondition, re-assemble, and re-install making all necessary adjustments.

Dis-assembly and Re-assembly

The terms 'Dis-assembly' and 'Re-assembly' indicate the orderly taking apart of an assembly into individual parts and rebuilding it into the original assembly.

Adjust

Make the necessary adjustments to restore specified setting or performance.

Check

Ascertain if a setting or condition is within the limits of acceptability, either as defined in the manufacturer's specifications or, where a dimension is not specified, in the judgement of the mechanic. The checking of fixings, e.g. nuts and bolts, includes tightening to the specified torque figures listed in this Manual

Servicing

All technical work undertaken to maintain the machine in working order.

Special Tools

Where the use of a special tool is specified in an operation the tool number will be shown under the operation heading and also following the instruction requiring its use.

The use of the special tools mentioned in the text contributes to a safe, efficient and profitable repair. Some operations are impracticable without their use, for example, the refitment of the differential unit. Distributors and Dealers are therefore urged to check their tools against the list provided.

Repairs and Replacement

When service parts are required it is essential that only MF2605/2615 genuine parts are used for replacement.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories.

1. Safety features embodied in the tractor may be impaired if other than genuine parts are fitted.

2. In certain territories, legislation prohibits the fitting of parts not to the tractor manufacturer's specification.

3. Torque wrench setting figures given in the Workshop Manual must be strictly adhered to.

4. Locking devices where specified must be fitted. If the efficiency of a locking device is impaired during removal it must be renewed.

The tractor warranty may be invalidated by the fitting of parts other than genuine MF2605/2615 parts. All MF2605/2615 replacements have the full backing of the manufacturer's warranty. MF2605/2615 Distributors and Dealers are obliged to supply only genuine service parts.

Repair of the Tractor

Follow these important points :

CLEAN THE TRACTOR AND DIAGNOSE THE FAULT BEFORE DIS-ASSEMBLY

If possible, make a complete diagnosis to determine the extent of the repair required. Take precautions, as necessary to prevent dirt or other foreign material entering the hydraulic, fuel or air systems.

DO NOT MIX PARTS

Make particular note of special parts which should not be interchanged.

DURING DIS-ASSEMBLY, CLEAN PARTS THOROUGHLY AND INSPECT THEM FOR WEAR, DAMAGE, ETC.

LABEL PARTS.

PROTECT PRECISION OR MACHINED SURFACES.

SAFETY ALERT SYMBOL AND TERMS

SAFETY ALERT SYMBOL

This is the safety alert symbol. It means ATTENTION! BECOME ALERT! SAFETY IS INVOLVED! Look for it, both in this manual and on safety signs on the tractor. It will direct your attention to information that involves your safety and the safety of others.

Fig 1

SIGNAL WORDS

The words **DANGER, WARNING** or **CAUTION** are used with the safety alert symbol. Learn to recognize these safety alerts and follow the recommended precautions and safe practices.

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in DEATH OR VERY SERIOUS INJURY.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in DEATH OR SERIOIUS INJURY.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in MINOR INJURY.

INFORMATIONAL MESSAGES

The words ***IMPORTANT*** and ***NOTE*** are not related to personal safety, but are used to give additional information and tips for operating or servicing the equipment.

IMPORTANT: IMPORTANT: *Identifies special instructions or procedures that, if not strictly observed,could result in damage to, or destruction of the tractor, attachments or the environment.*

NOTE: *Identifies points of particular interest for more efficient and convenient operation or repair.*

1A .2 SAFETY IN THE WORKSHOP

This safety section of your Workshop Service manual is intended to point out some of the basic safety situations which may be encountered during the normal repair operations of the tractor, and to suggest possible ways of dealing with these situations.

Additional precautions may be necessary, depending on the type of repair and the conditions at the work site or in the workshop. MF2605/2615 has no direct control over the repair procedures, operation, inspection, lubrication or general maintenance. Therefore it is YOUR responsibility to use good safety practices in these areas.

Safety – a word to the Mechanic

It is your responsibility to read and understand this safety section before carrying out repairs on MF2605/2615 equipment.

Remember that YOU are the key to safety. Good safety practices not only protect you, but also the people around you. Study the features in this section and the rest of the manual and make them a working part of your safety programme. Practice all other usual and customary safe working precautions, and above all – REMEMBER - SAFETY IS YOUR RESPONSIBILITY. YOU CAN PREVENT SERIOUS INJURY OR DEATH.

SAFETY SIGN

WARNING : DO NOT remove or obscure Danger, Warning or Instruction sign.

Replace any Danger, Warning, Caution or Instruction sign that are not readable, damaged or are missing.

GENERAL

Practically all service work involves the need to drive a tractor. The Operator Instruction Book, supplied with each tractoror implement, contains detailed safety precautions relating to driving, operating and servicing. These precautions are as applicable to the service mechanic as they are to the operator, and should be read, understood and practised by all personnel.

Prior to undertaking any maintenance, repair, overhaul, dismantling or re-assembly operations, whether within a workshop facility or out in the field, consideration should be given to factors that may have an effect upon Safety, not only upon the mechanic carrying out the work, but also upon bystanders.

- DO NOT allow children or bystanders around or on the machine while it is being adjusted, serviced, repaired or operated.

PERSONAL CONSIDERATIONS

Clothing

- The wrong clothes or carelessness in dress can result in entanglement in moving parts. Check to see that you are suitably clothed. DO NOT wear loose clothing or long hair around equipment.

  Some jobs require special protective equipment.

Eye Protection

- The smallest eye injury may cause loss of vision. Injury can be avoided by wearing the proper eye protection when engaged in chiselling, grinding, sanding, welding, painting etc.

- Wear safety goggles or safety glasses appropriate to the job in hand.

Breathing Protection

- Fumes,dust and paint spray are unpleasant and harmful. These can be avoided by wearing respiratory protection.

Hearing Protection

- Loud noise may damage your hearing. Longer the exposure greater the damage. Wear ear protection.

Hand Protection

- It is advisable to use a protective barrier cream before work to prevent irritation and skin contamination. After work clean your hands in soap and water. Solvents such as white spirit, paraffin, etc., may harm the skin.

- Wear gloves when ever possible to protect your hands. DO NOT wear rings or wrist watches when working on machinery, as they could catch on moving parts and cause serious injury.

Foot Protection

- Substantial or protective footwear with reinforced toe-caps (safety shoes) will protect your feet from falling objects. Additionally, oil-resistant soles will help to avoid slipping.

Special Clothing

- For certain work it may be necessary to wear flame or acid-resistant clothing.

EQUIPMENT CONSIDERATIONS

Machine Guards

- Before using any machine, check to ensure that the machine guards are in position and serviceable. These guards not only prevent parts of the body or clothing coming in contact with the moving parts of the machine, but also ward off objects that might fly off the machine and cause injury. Ensure that missing guards are replaced.

Lifting Appliances

- Always ensure that lifting equipment, such as chains, slings, lifting brackets, hooks and eyes are thoroughly checked before use. If in doubt, select stronger equipment than is necessary.
- Never stand under a suspended load or raised implement.
- Avoid injury through incorrect handling of components. Make sure you are capable of lifting the object. If in doubt get help.

Jacking

- Select a jack strong enough to carry the load.
- Stabilize the tractor and chock the wheels.
- Put support stands under the tractor. Lower the jack and let the tractor rest on the stands.
- DO NOT go under a tractor supported by a chain hoist or jack.

Compressed Air

- The pressure from a compressed air line is often as high as 7 bar (100 lbs/in^2). Any misuse may cause injury.
- Never use compressed air to blow dust, filings, dirt etc., away from your work area unless the correct type of nozzle is fitted and eye protection is used.
- Compressed air is not a cleaning agent, it will only move dust, etc., from one place to another. Look around before using an air hose as bystanders may get grit into their eyes, ears or skin.
- Used approved air guns, wear safety goggles, and use proper shielding to protect yourself and others in the work area.
- Never point an air nozzle at a persons body.

Hand Tools

- Many cuts, abrasions and injuries are caused by defective tools. Never use the wrong tool for the job, as this generally leads either to some injury, or to a poorly done job.
- Never use
  - A hammer with a loose head or split handle.
  - Spanners or wrenches with splayed or worn jaws.
  - Spanners or files as hammers; or drills, clevis pins or bolts as punches.
- Grind off mushroom heads from chisels. The sharp edges can tear your skin if the tool slips. And, when the tool is struck, chips could break off and fly into your eyes.
- Keep a handle on every file to prevent the tang from piercing your palm or wrist if the file should slip or catch.
- For removing or replacing hardened pins use a copper or brass drift rather than a hammer.
- For dismantling, overhauling and assembly of major components, always use Special Service Tools recommended.
- These will reduce the work effort, labour time and repair cost.
- Always keep tools clean and in good working order.

Electricity

- Electricity has become so familiar in day to day usage, that its potentially dangerous properties are often overlooked. Misuse of electrical equipment can endanger life.
- Before using any electrical equipment particularly portable appliances – make a visual check to make sure that the cable is not worn or frayed and that the plugs, sockets, etc., are intact. Make sure your know where the nearest isolating switch is located. Always use an earthed (grounded) 3 pin electrical cord.

GENERAL CONSIDERATION

Solvents

- Use only cleaning fluids and solvents that are known to be safe. Certain type of fluid can cause damage to components such as seals, etc., and cause skin irritation. Solvent label is to be checked whether chemical contained in it is harmful to the individual who uses it.

Housekeeping

- Many injuries result from tripping or slipping over or on, objects or material left lying around by a careless worker. Prevent these accidents from occurring. If you notice a hazard, don't ignore it – remove it.
- A clean, hazard-free place of work improves the surroundings and daily environment for everybody.
- Keep work organised and clean. Wipe up spills of any kind to minimise the possibility of a fall. Keep tools and parts off the floor to further reduce the possibility of tripping and causing serious injury.

Fire

- Fire has no respect for persons or property. The destruction that fire can cause is not always fully realised. Everyone must be constantly on guard.
  - Extinguish matches, cigars, cigarettes, etc., before throwing them away.
  - Keep the environment clean by disposing waste through proper container.
  - Locate the fire extinguishers and find out how to operate them.
  - DO NOT allow or use open flame near the fuel tank, fuel lines, battery, hydraulic hoses or component parts.
- When using a gas torch, always keep a fully charged fire extinguisher within reach.
- In the event of fire :
  - DO NOT panic – warn those near and raise the alarm.

First Aid

- In the type of work that mechanics are engaged in, dirt, grease, fine dust, etc. all settle upon the skin and clothing. If a cut, abrasion or burn is disregarded it may be found that an infection has formed within a short time. What appears at first to be trivial could become painful and injurious. It takes few minutes to have a fresh cut dressed, but it will take longer if you neglect it. Make sure you know where the First Aid box is located and it is kept fully stocked at all times.

OPERATIONAL CONSIDERATIONS

- Stop the engine, before performing any service.
- Place a warning sign on self propelled equipment which, due for service or overhaul, would be dangerous to start. Disconnect the battery leads if leaving such a unit unattended and remove the key.
- DO NOT attempt to start the engine while standing besides the tractor or attempt to by-pass the safety start switch. Make it a routine to check whether safety neutral switch are functioning properly.
- Avoid prolonged running of the engine in a closed building or in an area with inadequate ventilation as exhaust fumes are highly toxic
- If possible, wait for the radiator to cool before removing the cap. Place a rag over the cap to contain any released coolant and wear an insulating glove to protect your hand. Turn the cap to the first stop and wait until pressure in the system is released before removing the cap.
- Never work beneath a tractor which is on soft ground. Always take the unit to an area which has a hard level working surface (concrete is preferred) and use a mechanical jack if required.
- If it is found necessary to raise the equipment for ease of servicing or repair, make sure that safe and stable supports are installed beneath axle housing, casings, etc., before commencing work.
- Certain repair or overhaul procedures may necessitate 'Separating the tractor' either at the engine / gearbox / rear axle locations. These operations are simplified by the use of the Tractor Splitting Kit / stands. Should this equipment not be available, then every consideration must be given to stability, balance and weight of the components, especially if a cab is installed.
- Use footsteps or working platforms when servicing those areas that are not within easy reach.
- Cleanliness of the tractor hydraulic system is essential for optimum performance. When carrying

out service and repairs plug all hose ends and component connections to prevent dirt entry.

- Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficiency and working life of a component and lead to costly replacement. Use of high pressure water or steam cleaner is recommended.
- Before loosening any hoses or tubes connecting implements to remote control valves, etc., switch off the engine, remove all pressure in the lines by operating levers several times.
- Prior to pressure testing, make sure all hoses and connectors not only of the equipment, but also those of the test equipment, are in good condition and tightly sealed. Pressure readings must be taken with the gauges specified. The correct procedure should be rigidly observed to prevent damage to the system or equipment, and to eliminate the possibility to reduce the risk.
- Hydraulic fluid escaping under pressure can have enough force to penetrate the human skin. To locate a leak under pressure, use a small piece of cardboard, never use your hands. If you are injected with hydraulic fluid seek medical help immediately.
- When equipment or implements are required to be attached to the hydraulic linkage, either for testing purposes or for transportation, the 'Position Control' should be used.
- Always lower equipment to the ground when leaving the tractor.
- If high lift attachments are installed on a tractor beware of overhead power, electric or telephone cables when travelling. Drop the attachment near to ground level to increase stability and minimise risks.
- DO NOT park or attempt to service the equipment on an incline. If unavoidable, take extra care and chock all wheels.
- Prior to removing wheels and tires from a tractor, check to determine whether additional ballast (liquid or weights) has been added Seek assistance and use suitable equipment to support the weight of the wheel assembly. Store the wheel so that they cannot fall over and cause injury.
- When inflating tires beware of over inflation – constantly check the pressure. Over inflation can cause tires to burst and result in personal injury.

SERVICING TECHNIQUES

Service Safety

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all farm machinery as well as the personal safety of the individual doing the work.

This Service Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure that a thorough repair is successfully completed.

There are numerous variations in procedures, techniques, tools, and parts for servicing tractors, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Anyone who departs from the instructions provided in this Manual must realise that one compromises their personal safety and the tractor's integrity by the choice of repair methods, tools and / or parts.

Service Techniques

Clean the exterior of all components before carrying any form of repair. Dirt and abrasive dust can reduce the efficient working life of a component and lead to costly replacement.

Time spent on the preparation and cleanliness of working surfaces will pay dividends in making the job easier and safer and will result in overhauled components being more reliable and efficient in operation.

Use cleaning fluids which are known to be safe. Certain types of fluid can cause damage to 'O' rings and cause skin irritation. Check the label on solvents to ensure that they are suitable for the cleaning of components and also that they DO NOT risk the personal safety of the user.

Replace 'O' rings, seals or gaskets whenever they are disturbed. Never mix new and old seals or 'O' rings, regardless of condition. Always lubricate new seals and 'O' rings with hydraulic oil before installation.

When replacing component parts use the correct tool for the job.

Hoses and Tubes

Always replace hoses and tubes if their ends are damaged.

When installing a new hose, loosely connect each end and make sure the hose takes up the designed position before tightening the connection. Clamps should be tightened sufficiently to hold the hose without crushing and to prevent chafing or contact with other parts.

Before removing hoses or tubes make sure they are identified so that they can be correctly re-assembled.

Be sure any hose which has been installed is not kinked or twisted after it is tightened.

Bearings

Bearings which are considered suitable for further service should be cleaned in a suitable solvent and immersed in clean lubricating oil until required.

DO NOT spin bearing with compressed air the centrifugal force could cause a ball or roller to fly outward with enough force to cause an injury.

Installation of a bearing can be classified in two ways. Press fit on rotating parts such as shafts & gears. Push fit into static locations such as reduction gear housings. Where ever possible, install the bearing onto the rotating component first.

Always use pullers or a press to remove and / or install bearings, bushings and cylinder sleeves, etc. Use hammers, punches and chisels only when absolutely necessary and be sure to wear safety goggles.

Shims

When shims are removed, tie them together and identify them as to location. Keep shims clean and flat until they are re-installed.

Gaskets

Be sure the holes in the gasket correspond with the lubricant passages in the mating parts. If gaskets are to be made, select material of the proper type and thickness. Be sure to cut holes in the right places. Blank gaskets can cause serious damage – always renew gaskets prior to re-installation.

Lip Type Seals

Lubricate the lips of the lip-type seals before installation. Use petroleum jelly. DO NOT use grease. Ensure that the oil seal is fitted the right way round, the lip of the seal is placed next to the lubricant that is sealed. Some seals have a second auxiliary lip, which is used to prevent the ingress of dirt to the seal lip.

During Installation, if the seal lip must pass over a shaft that has splines, a keyway, rough surface or a sharp edge, the lip can be easily damaged. Always use a seal protector, when one is provided.

Use of Bolts in Blind Holes

Use bolts of the correct length. A bolt which is too long may 'bottom' before the head is tight against the part it is to hold. The threads can be damaged when a 'long' bolt is removed. If a bolt is too short, there may not be enough threads engaged to hold the part securely.

Locking Devices

Lockwashers, flat metal locks or split pins are used to lock nuts and bolts.

Flat metal locks must be installed properly to be effective. Bend one end of the lock around the edge of the part. Bend the other end against one flat surface of the nut or bolt head. Always install new locks.

Always fit new split pins / cotter pins and bend the ends round so that they will not catch in clothing and help to prevent cuts.

Cables and Wires

When removing or disconnecting a group of cables or wires, tag each one to assure proper re-assembly.

Always clip back wires and cable looms properly to prevent chafing, cable damage and possible damage by fire.